

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2004/016165

A. CLASSIFICATION OF SUBJECT MATTER

Int.Cl⁷ G02F1/37

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Int.Cl⁷ G02F1/35, G02F2/02, H01S3/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

| | | | |
|---------------------------|-----------|----------------------------|-----------|
| Jitsuyo Shinan Koho | 1922-1996 | Toroku Jitsuyo Shinan Koho | 1994-2005 |
| Kokai Jitsuyo Shinan Koho | 1971-2005 | Jitsuyo Shinan Toroku Koho | 1996-2005 |

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

JICST, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|-----------|--|--|
| X Y | TANABE, T. et al., Frequency-tunable high-power terahertz wave generation from GaP, Journal of Applied Physics., Vol.93, No.8, 15 April, 2003 (15.04.03), pages 4610 to 4615 | 1,2,10 3-6,11-16, 18-20 |
| X Y | TANABE, T. et al., Frequency-tunable terahertz wave generation via excitation of phonon-polaritons in GaP, 2003, Int.Symp.Comp. Semicond., pages 193 to 194 | 1,2,10,15,18 3-6,11-14, 16,19,20 |
| X Y | TANABE, T. et al., Characteristics of terahertz-wave generation from GaSe crystals, Journal of Physics D:Appl.Phys., Vol.37, No.2, 21 January, 2004 (21.01.04), pages 155 to 158 | 7,9 8 |

 Further documents are listed in the continuation of Box C. See patent family annex.

| | |
|---|--|
| * Special categories of cited documents: | |
| "A" document defining the general state of the art which is not considered to be of particular relevance | "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention |
| "E" earlier application or patent but published on or after the international filing date | "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone |
| "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) | "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art |
| "O" document referring to an oral disclosure, use, exhibition or other means | "&" document member of the same patent family |
| "P" document published prior to the international filing date but later than the priority date claimed | |

Date of the actual completion of the international search
24 January, 2005 (24.01.05)Date of mailing of the international search report
08 February, 2005 (08.02.05)Name and mailing address of the ISA/
Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|-----------|--|-----------------------|
| X | Wei Shi et al., Efficient, tunable, and coherent 0.18-5.27-THz source based on GaSe crystal, Optics Letters, Vol.27, No.16, 15 August, 2002 (15.08.02), pages 1454 to 1456 | 7, 9 8 |
| Y | JP 10-213828 A (Mitsubishi Heavy Industries, Ltd.), 11 August, 1998 (11.08.98), (Family: none) | 3, 19 |
| Y | JP 2002-287190 A (The Institute of Physical and Chemical Research), 03 October, 2002 (03.10.02), (Family: none) | 4-6, 8, 11-13, 20 |
| Y | JP 05-110179 A (Hamamatsu Photonics Kabushiki Kaisha), 30 April, 1993 (30.04.93), (Family: none) | 14 |

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Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

A technical matter common to all the claims is allowing first and second pump lights to enter a non-linear optical crystal to change the frequency of the second pump light, thereby generating a variable-wavelength tera-hertz electromagnetic wave. However, the matter is well known (in documents 1-4 referred to in the international search report), and does not constitute a technical feature that makes contribution over the prior art.

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

The additional search fees were accompanied by the applicant's protest.
 No protest accompanied the payment of additional search fees.